AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (Currently Amended) A method for preventing preignition in ~~an~~ a spark ignition engine comprising:

identifying at least one engine condition that relates to autoignition in the engine;

retarding spark in the engine if the engine condition exceeds a threshold;

detecting whether autoignition occurs in the engine due to the retarded spark advance; and

correcting the engine condition by at least one of reducing a throttle opening, cutting off fuel to a cylinder, adjusting a camshaft phase, and storing a diagnostic code if autoignition is detected.

2. (Original) The method of claim 1 wherein the at least one engine condition is at least one of coolant temperature, throttle position, air/fuel ratio, manifold pressure, and cylinder air flow.

3. (Currently Amended) The method of claim 1 wherein the step of retarding spark ~~delivery~~ is performed if the engine condition exceeds the threshold for a first period.

Serial No. 10/664,323

4.   (Original)   The method of claim 1 wherein the step of detecting autoignition includes detecting whether a cylinder misfire occurs in the engine.

5.   (Original)   The method of claim 4 wherein the step of detecting the cylinder misfire is performed using RPM variation analysis.

6.   (Original)   The method of claim 4 wherein the step of detecting the cylinder misfire is performed using ion sensing.

7.   (Original)   The method of claim 4 wherein the step of detecting the cylinder misfire is performed using cylinder pressure sensing.

8.   (Original)   The method of claim 4 further comprising diagnosing autoignition if a cylinder misfire is not detected.

9.   (Original)   The method of claim 8 wherein diagnosing autoignition includes:

    calculating a ratio of autoignition occurrences;

    comparing the ratio to a second threshold; and

    diagnosing autoignition if the ratio exceeds the second threshold.

10.   (Original)   The method of claim 1 wherein detecting autoignition includes applying an ion current through a spark gap and monitoring the ion current after the spark retard.

11.   (Currently Amended)   A method for preventing preignition in ~~an~~ a spark ignition engine comprising:

identifying a plurality of engine conditions that relates to autoignition in the engine;

retarding spark in the engine if the plurality of engine conditions exceeds corresponding thresholds;

detecting whether autoignition occurs in the engine due to the retarded spark advance; and

correcting the plurality of engine conditions by at least one of reducing a throttle opening, cutting off fuel to a cylinder, adjusting a camshaft phase, and storing a diagnostic code if autoignition is detected.

12.   (Original)   The method of claim 11 wherein the plurality of engine conditions includes at least one of coolant temperature, throttle position, air/fuel ratio, manifold pressure, and cylinder air flow.

13.   (Currently Amended)   The method of claim 12 wherein the step of retarding spark ~~delivery~~ is performed if the plurality of engine conditions exceeds the thresholds for a first period.

14. (Currently Amended) An engine preignition prevention system comprising:

at least one sensor that identifies at least one engine condition that relates to autoignition;

a controller that retards spark in the engine if ~~the~~ at least one engine condition exceeds a threshold and that detects whether autoignition occurs in the engine due to the retarded spark advance; and

wherein the controller communicates with the at least one sensor corrects the engine condition by at least one of reducing a throttle opening, cutting off fuel to a cylinder, adjusting a camshaft phase, and storing a diagnostic code if autoignition is detected.

15. (Original) The engine preignition prevention system of claim 14 wherein the at least one engine condition is at least one of coolant temperature, throttle position, air/fuel ratio, manifold pressure, and cylinder air flow.

16. (Currently Amended) The engine preignition prevention system of claim 14 wherein the controller retards ~~the~~ spark in the engine if the engine condition exceeds a threshold for a period.

17. (Original) The engine preignition prevention system of claim 14 wherein the controller detects autoignition by detecting whether a cylinder misfire occurs in the engine.

18.   (Original)   The engine preignition prevention system of claim 17 wherein the controller detects whether a cylinder misfire occurs using RPM variation analysis.

19.   (Original)   The engine preignition prevention system of claim 17 wherein the controller detects whether a cylinder misfire occurs using ion sensing.

20.   (Original)   The engine preignition prevention system of claim 17 wherein the controller detects whether a cylinder misfire occurs using cylinder pressure sensing.

21.   (Original)   The engine preignition prevention system of claim 17 wherein the controller diagnoses an autoignition condition if a cylinder misfire is not detected.

22.   (Original)   The engine preignition prevention system of claim 14 wherein the controller detects autoignition by applying an ion current through a spark gap and monitoring the ion current after the spark retard.

Serial No. 10/664,323   Page 6 of 11

23. (Original) The engine preignition prevention system of claim 21 wherein the controller diagnoses an autoignition condition by:

calculating a ratio of autoignition occurrences per number of engine cylinder cycles;

comparing the ratio to a second threshold; and

diagnosing the autoignition condition if the ratio exceeds the second threshold.